

App. No 09/651,797
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Reply to Office Action of March 26, 2004 (and August 20, 2003)

REMARKS/ARGUMENTS

Claims 1 – 6 and 8 - 20 are pending in the application with claims 1 - 5 being withdrawn from further consideration on the merits as being drawn to a non-elected invention and claims 6 and 8 - 20 being considered on the merits.

Claims 6 and 8 have been amended and claim 7 has been cancelled.

In the Office Action, claims 6 - 20 are rejected under 35 U.S.C 103(a) as being unpatentable over G9400222.3 (PTO-1449) in view of US Patent No. 4,653,732 to Wunning et al. Additionally, in the Office Action dated 03/26/2004, it is alleged that Applicant's reply filed on December 22, 2003 is not fully responsive to the Office Action dated 08/20/2003 for the reason that the arguments presented with respect to the patentability to claim 6 are not applicable to claim 17. Applicants hereby further respond to the Office Action dated 08/20/2003, and respond to the Office Action dated 03/26/2004, by requesting favorable reconsideration of the rejection 17 in view of the following comments.

Claim 17 of the present application recites an apparatus for the thermal treatment of metallic workpieces including a quenching chamber for receiving preheated workpieces and a quenching gas for cooling same and means for guiding individual substantially laminar flows of quenching gas around the workpieces in a manner such that each respective individual flow of quenching gas around a respective one of the workpieces remains out of contact with the other respective individual flows of quenching gas during its flow around the respective workpiece, wherein each individual flow of quenching gas is substantially laminar due to the absence of turbulence-

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generating mixing which would otherwise occur if the flows of quenching gas were not prevented from mixing with one another. Additionally, the means for guiding individual substantially laminar flows of quenching gas includes a plurality of guide channels each having a closed lateral surface and being disposable in surrounding relationship around a respective one of the workpieces for directing a substantially laminar flow of quenching gas around the respective workpiece.

The apparatus recited in claim 17 of the present application advantageously guides the quenching gas in an individual manner around each workpiece in a substantially laminar flow which promotes intense and uniform quenching of the workpieces. Since the apparatus recited in claim 17 includes means for guiding individual substantially laminar flows of quenching gas around the workpieces in a manner such that each respective individual flow of quenching gas around a respective one of the workpieces remains out of contact with the other respective individual flows of quenching gas during its flow around the respective workpiece, each directed flow of quenching gas flowing through past a respective workpiece cannot influence and, thus, generate turbulence with, the directed flows of quenching gas flowing past other workpieces.

In the Office Action, it is asserted that G9400222.3 discloses, in Figures 1 and 2 thereof, a cooling chamber with nozzle plate (10) and cooling plate (11) formed to a contour of workpiece loads such as a tunnel and, further, that the plates can be lowered onto the workpieces positioned in the cooling chamber. The Office Action asserts that the plate arrangements of G9400222.3 provide uniform cooling which reads on laminar

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cooling.

The Office Action notes, however, that G9400222.3 fails to disclose a closed lateral surface. Nonetheless, the Office Action asserts that Wunning et al '732, in Column 3, lines 25 -28 thereof, discloses that the cooling/side plates of G9400222.3 could be replaced by blank plates which have a closed lateral surface for throughflow type cooling. It is therefore asserted in the Office Action that it would have been obvious for one of ordinary skill in the art at the time the invention was made to have replaced side plates with blank plates as taught by Wunning et al '732 for throughflow type cooling.

Applicants respectfully submit that there is no teaching or motivation in the prior art for one of skill in the art to combine the disclosures of G9400222.3 and Wunning et al '732 so as to teach or render obvious the apparatus of the present invention. Additionally, Applicants submit that, even if there were some teaching or motivation for one of skill in the art to combine the G9400222.3 and Wunning et al '732 disclosures, which Applicants assert there is not, neither G9400222.3 nor Wunning et al '732 teach or suggest selectively combining their respective arrangements in the manner suggested in the Office Action. Furthermore, Applicants assert that the teachings of G9400222.3 and Wunning et al '732 themselves would teach away from combining the G9400222.3 and the Wunning et al '732 arrangements in the manner suggested in the Office Action for the reasons, as explained in more detail shortly, that the resulting new arrangement created by combining the G9400222.3 and Wunning et al '732 arrangements as suggested in the Office Action would either undercut or subvert the

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operation of the G9400222.3 arrangement. Thus, it is Applicants' position that the only teaching or motivation to combine the G9400222.3 and Wunning et al '732 arrangements in the manner suggested in the Office Action comes from a hindsight reconstruction based on the disclosure of the present application and, further, it is Applicants' position that the rejection of claim 17 of the present application as obvious in view of the combination of G9400222.3 and Wunning et al '732 under 35 USC Section 103(a) is improper for the reason that the combination of these prior art references is based upon such hindsight reconstruction.

G9400222.3 discloses an arrangement in which cooling gas is circulated in a cooling chamber 1 with the cooling gas being aimed onto the workpieces 4 in the desired direction of flow by nozzles arranged in a nozzle plate 10. Additionally, in the G9400222.3 arrangement, cooling plates 11 are disposed laterally of the workpieces 4.

Turning to US Patent No. 4,653,732 to Wunning et al, this reference discloses, in one embodiment thereof illustrated in Figure 5, a particular furnace charge and nozzle arrangement operable to quench a charge 11a consisting of a plurality of cylindrical workpieces 30. A horizontal nozzle plate 20 is inserted in the nozzle box 18 above the charge 11a and supports nozzle openings 35 in an even distribution over its entire surface.

Thus, G9400222.3 and Wunning et al '732 each disclose respective self-contained quenching arrangements that affect the quenching of workpieces in a manner different than the quenching method of the other reference. Neither G9400222.3 nor Wunning et al '732 provide one of ordinary skill in the art with any hint of the desirability

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of selectively exchanging a component of the respective quenching arrangement of one reference for a component of the quenching arrangement of the other reference.

Moreover, it is submitted that neither G9400222.3 nor Wunning et al '732 provide any motivation to one of ordinary skill in the art to selectively combine the G9400222.3 and the Wunning et al '732 arrangements as suggested in the Office Action – namely, to selectively replace the cooling/side plates of G9400222.3 by blank plates which have a closed lateral surface for throughflow type cooling. The Office Action asserts, in this regard, that Wunning et al '732, in Column 3, lines 25 –28 thereof, discloses that the cooling/side plates of G9400222.3 could be replaced by blank plates which have a closed lateral surface for throughflow type cooling. However, with respect to the blank plates of the Wunning et al '732 arrangement, Wunning et al '732 itself states, in Column 6, lines 33 – 38: "For uniform and intensive gas quenching, it is necessary to have through-flow cooling with parallel flow of gas. For this purpose, a horizontal nozzle plate 20 is inserted in the nozzle box 18 above the charge 11a, while blank plates 21 are provided at the sides of the charge 11a." Note that Wunning et al '732's own disclosure indicates that the blank plates 21 are not provided around individual ones of the workpieces 30 but are, instead, "provided at the sides of the charge 11a" – i.e., around the periphery of the entire charge 11a of the workpieces 30 to be quenched. Thus, even if there were some motivation for one of ordinary skill in the art to selectively combine components of the respective quenching arrangements of G9400222.3 and Wunning et al '732 with one another, which Applicants submit there is not, Wunning et al '732 itself teaches that the blank plates 21 are to be disposed around

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the periphery of the entire group of the workpieces 30 to be quenched, not around any one individual workpiece 30. Such a configuration in which the blank plates 21 do not provide a closed lateral surface around each workpiece would, it is submitted, result in the individual flows of quenching gas around the workpieces 30 interfering with and influencing one another. In contrast, the means for guiding individual substantially laminar flows of quenching gas around the workpieces of the apparatus recited in claim 17 includes a plurality of guide channels each having a closed lateral surface and being disposable in surrounding relationship around a respective one of the workpieces for directing a substantially laminar flow of quenching gas around the respective workpiece.

In fact, even in the respective Wunning et al '732 arrangement in which the blank plates 21 are deployed, there are no individual flow guiding structures which completely surround, partially surround, or which are even associated with, any of the workpieces 30; instead, the workpieces 30 are subjected to the flows of quenching gas flowing through each of the nozzle openings 35 in the nozzle plate 20 which are free to mix with, and be contacted by, the flows of quenching gas being introduced via the adjacent nozzle openings 35. As can be appreciated, the nozzle openings arrangement disclosed in US Patent No. 4,653,732 to Wunning et al produces turbulent, non-laminar flows around the workpieces 30 to be quenched.

In view of the fact that Wunning et al '732 lacks any hint or teaching concerning the desirability of replacing the cooling/side plates of G9400222.3 with the blank plates 21 of Wunning et al '732, let alone any teaching of how such a replacement could be effected, it would be necessary for one of ordinary skill in the art to find some hint in

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G9400222.3 of the desirability of replacing the cooling/side plates of G9400222.3 with the blank plates 21 of Wunning et al '732. However, G9400222.3 provides no hint of the need for, or the desirability of, replacing its cooling/side plates with another structure, let alone the specific structure of the blank plates 21 of Wunning et al '732. Accordingly, it is submitted that there exists no teaching in the prior art of the desirability of selectively combining the G9400222.3 and Wunning et al '732 disclosures in the manner suggested in the Office Action to provide an apparatus as recited in claim 17 of the present application.

Moreover, even if there were some teaching or motivation for one of skill in the art to combine the G9400222.3 and Wunning et al '732 disclosures, which Applicants assert there is not, neither G9400222.3 nor Wunning et al '732 teach or suggest the manner in which their respective arrangements should be combined, let alone teaching or suggesting the manner in which the blank plates 21 of Wunning et al '732 should replace the cooling/side plates of G9400222.3, as is asserted in the Office Action. As noted, Wunning et al '732, with its disclosure of the deployment of the blank plates 21 in surrounding relationship to the totality of the charge 11a of the workpieces 30 to be quenched, does not at all contemplate the use of separate nozzle plates and cooling/side plates as is disclosed in G9400222.3. Likewise, G9400222.3, with its disclosure of separate nozzle plates and cooling/side plates, does not at all contemplate the deployment of any peripheral blank plates for surrounding the group of its workpieces 4 as a whole. Accordingly, even if one of skill in the art were motivated to selectively modify the G9400222.3 arrangement with the Wunning et al '732

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arrangement as suggested in the Office Action, no guidance is provided from G9400222.3, Wunning et al '732, or any other prior art, as to the manner in which one of skill in the art should modify the G9400222.3 arrangement.

Furthermore, it is submitted that the resulting new arrangement created by combining the G9400222.3 and Wunning et al '732 arrangements as suggested in the Office Action would either undercut or subvert the manner in which the G9400222.3 arrangement quenches its workpieces 4. For example, the function of the cooling plates 11 of the G9400222.3 arrangement is to operate in cooperation with the nozzle plates 10 and conduct away heat from the adjacent workpieces 4. However, it cannot be seen how an arrangement as suggested by the Office Action in which the blank plates 21 would be arranged in a laterally surrounding manner around the workpieces 4 would promote the conducting away of heat from the workpieces 4. Moreover, since the G9400222.3 arrangement discloses the use of the nozzles plates 10, it can be seen that a substitution of the blank plates 21 of Wunning et al '732 for the cooling plates 11 of G9400222.3 would yield an arrangement in which the workpieces are still subjected to a non-laminar, turbulent flow whereas, in contrast, the apparatus of the present invention recited in claim 17 includes means for guiding individual substantially laminar flows of quenching gas around the workpieces in a manner such that each respective individual flow of quenching gas around a respective one of the workpieces remains out of contact with the other respective individual flows of quenching gas during its flow around the respective workpiece, whereupon the quenching gas is guided in an

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individual manner around each workpiece in a substantially laminar flow which promotes intense and uniform quenching of the workpieces.

Accordingly, it is submitted that the apparatus recited in claim 17 is neither taught nor disclosed by the prior art of record. Reconsideration of the rejection of claim 17 under 35 U.S.C. Section 103(a) is therefore respectfully requested.

Applicants submit that claims 6 and 8 - 20 are now in condition for allowance and that non-elected claims 1 - 5 should now be considered and early action toward these ends is respectfully requested.

However, should the Examiner have any further comments or suggestions, the undersigned would very much welcome a telephone call in order to resolve any outstanding issues and expedite placement of the application into condition for allowance.

Respectfully Submitted,



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